

REMARKS

No new matter is believed to be added to the application by this Reply.

Finality of Rejection

Further to the Reply of December 4, 2003, The Examiner has performed additional search and consideration. The Office Action of February 18, 2004 includes a PTO-892 form containing a reference to newly cited Jeong (U.S. Patent 6,081,308) which has not been earlier considered. As a result, the applicant has had no opportunity to respond to the new rejections based upon Jeong, and a clear issue has not been developed between the Examiner and the applicant. See MPEP 706.07.

The Examiner is accordingly respectfully requested to consider the application under non-final rejection.

Status of the Claims

Claims 1-12 are pending in the application and stand rejected.

Rejections Based On Jeong

Claims 1-5 and 7-11 are rejected under 35 USC §103(a) as being obvious over Jeong (U.S. Patent 6,081,308) in view of Kim (U.S. Patent 6,188,452). Applicant traverses. The Examiner adds the teachings of Kaneko (U.S. Patent 6,404,473) to the aforesaid rejection to reject claims 6 and 12 for obviousness under 35 USC §103(a). Applicant traverses.

The Present Invention and its Advantages

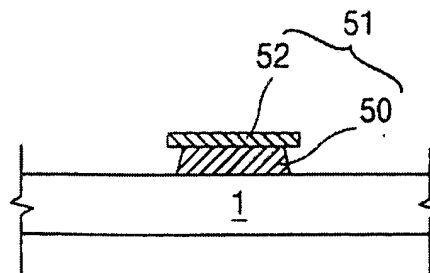
The present invention pertains to an array substrate for a liquid crystal display device which includes an electrode line formed on a substrate, an organic insulating layer formed on an exposed surface of the substrate while covering the electrode line, and the electrode line has an overhang or a taper angle of a side portion of the electrode line that is more than 45° from a top surface of the electrode line.

The invention finds a typical embodiment in claim 7, which sets forth:

7. An array substrate for a liquid crystal display device, comprising:
 - an electrode line formed on a substrate; and
 - an organic insulating layer formed on an exposed surface of the substrate while covering the electrode line,
 - wherein the electrode line has an overhang or a taper angle of a side portion of the electrode line [which] is more than 45° from a top surface of the electrode line.

A typical geometry of the invention can be understood by referring to Figure 4A of the application, which is reproduced below.

Fig.4A



As shown in Figure 4A an electrode line 51 has metal layers 50 and 52 that are sequentially deposited on a substrate 1 and then are patterned into a wire electrode 51. The angle of the overhang or taper is from the top of the electrode line 51, where independent claim 7 recites: "the electrode line has an overhang or a taper angle of a side portion of the electrode line is more than 45° from a top surface of the electrode line," and independent claim 1 recites: "the electrode line has a side portion having an overhang or a taper angle of more than 45° from a top surface of the electrode line."

Distinctions of the Invention Over Jeong and the Secondary References

Jeong pertains to a method for manufacturing a liquid crystal display using a Mo or MoW layer and an Al or Al alloy layer (see Abstract of Jeong). The Examiner turns to column 10, lines 9-12 of Jeong, which states: "The dual film made of Al or Al alloy and MoW alloy and the single film made of MoW alloy are etched with taper angle in the range of 30-90°."

First, Jeong fails to disclose "an organic insulating layer." In the present invention, the insulating layer is formed from an organic material. In contrast, the gate insulating layer of Jeong is formed of an inorganic material such as silicon nitride.

Jeong additionally fails to disclose or suggest an electrode line where "the electrode line has an overhang or a taper angle of a side portion of the electrode line [which] is more than 45° from a top surface of the electrode line," as set forth

in independent claim 7 (or similarly in claim 1). Jeong also fails to disclose or suggest a gate insulating layer made of an organic material such as benzocyclobutene, an acrylic-based insulating material or resin, as is admitted by the Examiner at page 3, lines 14-16 of the Office Action.

At page 3, lines 6-7 of the Office Action, the Examiner turns to Figures 33 and 34 of Jeong to allege teachings of greater than a 45° taper from a top surface of an electrode line. However, the angles shown in Figures 33 and 34 of Jeong (shown below) have a fundamentally different reference point.

FIG. 33

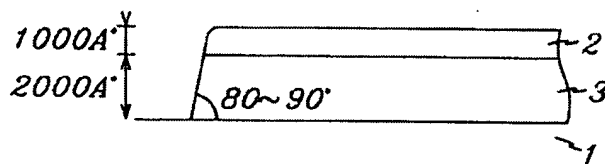
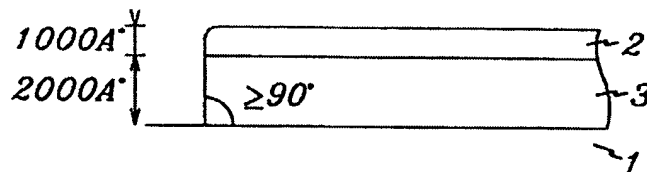


FIG. 34



As shown in Figures 33 and 34, Jeong measures an angle from the bottom surface of the electrode of a dual-filmed wiring. In contrast, independent claims 1 and 7 of the invention measures the angle "from a top surface of the electrode line."

The Examiner turns to Kim for teaching pertaining to a gate insulating layer made from an organic material. However, Kim was filed on July 7, 1997 and was issued on February 13, 2001, which was after the December 22, 2000 filing date of the instant application. Kim thus qualifies as prior art under 35 U.S.C. §102(e). Also, both Kim and the claimed invention were, at the time the invention was made, owned by the same entity or subject to an obligation of assignment to the same entity. Kim is thus removed as prior art under 35 U.S.C. §103(c).

The Examiner also turns to Kaneko for teaching pertaining to a three-layered structure having a protruding middle portion. However, Kim (if it could be used) and Kaneko each fail to address the deficiencies of Jeong in suggesting to one having ordinary skill the invention set forth in independent claims 1 and 7. A *prima facie* case of obviousness has thus not been made. Claims depending upon claims 1 and 7 are patentable for at least the above reasons.

These rejections are overcome and withdrawal thereof is respectfully requested.

Foreign Priority

The Examiner has acknowledged foreign priority in the Office Action mailed August 22, 2002.

Prior Art

The prior art cited but not utilized by the Examiner shows the status of the conventional art that the invention supercedes. Additional remarks are accordingly not necessary.

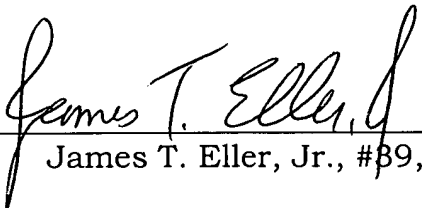
Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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